

ABSTRACT

The present invention relates to a high-cleanliness steel having a high fatigue strength and high cold workability, and a method of making the high-cleanliness steel. The method adds a Li-Si alloy having a Li content between 20 and 40% and/or Li_2CO_3 as a Li-containing substance to a molten steel. The Li-containing substance is added to the molten steel after the completion of a series of steps of a ladle refining process including composition adjustment, temperature adjustment and slag refining. The high-cleanliness steel has a total-Li content between 0.020 and 20 ppm by mass and contains 1.0 or below oxide inclusion particle having a major diameter of 20 μm or above at a maximum in 50 g of the steel wire. The steel contains an oxide inclusion that has a CaO content between 15 and 55%, SiO_2 content between 20 and 70%, an Al_2O_3 content of 35% or below, a MgO content of 20% or below and a Li_2O content between 0.5 and 20%. The high-cleanliness steel has improved fatigue characteristics and improved cold workability.